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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/810,853	03/16/2001	Kenichi Miyazawa	P5626a	6170

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EXAMINER

GOODWIN, JEANNE M

ART UNIT PAPER NUMBER

2841

DATE MAILED: 12/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/810,853

Applicant(s)

MIYAZAWA ET AL.

Examiner

Jeanne-Marguerite Goodwin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 March 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 15-21 is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☒ Claim(s) 13 and 14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 and 9-12 rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 4,075,845 to Allen [hereinafter Allen].

Allen discloses an apparatus comprises a mechanical system using mechanical power of a fluid such as water comprising a freeze water chamber (5) and heat tube (2) assembly (thermal converter) in a case, wherein, the method is to quick freeze water in a cylinder by external or internal low temperature means so that a piston (reciprocally movable drive member) in the cylinder, as the only movable part of the cylinder, will be driven or moved by the force of the water expansion, caused by such freezing to turn a crankshaft or turbine or other gear by a connecting rod or other device. An alternate or quick thawing of the ice so formed in the cylinder is provided by high temperature means applied externally or internally so that the resulting cylinder and piston operation or a multi cylinder and piston operation would cause a continuous operating cycle and power flow to the crankshaft or turbine by the connecting rod or other gear to the mechanical work such as to turn wheels to perform work (see column 1, lines 31-47). Allen discloses all the subject matter claimed by applicant with the exception of the limitation stated in claim 1, i.e., a power generator driven by mechanical energy to generate electric power; the limitation stated in claim 10, i.e., a gear train having a plurality of gear

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wheels to transfer the mechanical energy to the power generator; the limitation stated in claim 11, i.e., wherein the speed increasing ratio of the gear train is adjustable to achieve a desired power-generating efficiency; the limitation stated in claim 12, i.e., a mechanical energy accumulator.

With respect to the limitation stated in claim 1: Official Notice is taken with respect to driving a power generator by mechanical energy since it is well known in the art to drive a power generator by mechanical energy to generate electric power. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to use the power system as taught by Allen, to drive a power generator, as one of numerous ways to generate electric power, respectively.

With respect to the limitation stated in claim 10: It has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. See *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

With respect to the limitation stated in claim 11: Official Notice is taken with respect to adjustable gear trains as being known in the timepiece art. Therefore, it would have been obvious to a person having ordinary skill in the art to modify the gear train of Allen, by making the gear train adjustable, in order to adjust the fast/slow rate of the gear train for correction purposes. Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adjust the speed increasing ratio of the gear train, since it has been held that the provision of adjustability, where needed, involves only routine skill in the art. See *In re Stevens*, 101 USPQ 284 (CCPA 1954).

With respect to the limitation stated in claim 12: Official Notice is taken with respect to accumulating mechanical energy via an accumulator since it is very well known in the art to use accumulators in order for a power generator or alternator to continuously be driven by the mechanical energy accumulator serving as a buffer. Therefore, it would have been obvious to a person having ordinary skill in the art to add an accumulator, to the device of Allen, in order to accumulate the mechanical energy to continuously drive the wheels to perform work, respectively.

3. Claims 2-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Allen in view of US Patent 4,541,735 to Abu-Isa [hereinafter Abu-Isa].

Allen discloses the subject matter as stated above in paragraph 2. Allen discloses all the subject matter claimed by applicant with the exception of the limitation stated in claim 2, i.e., a mixture of compounds having different solid-liquid phase change temperature ranges; the limitation stated in claims 3 and 4, i.e., an additive adjusting the solid-liquid phase change temperature; and the limitation stated in claims 5 and 7, i.e., the phase change material changes substantially linearly over at least the temperature range in which the phase change material is in a solid-liquid phase.

With respect to claims 2-8: Abu-Isa teaches using a mixture of compounds including additives, e.g., copolymer (fluorocarbon elastomer) of hexafluoropropylene and vinylidene fluoride saturated with methanol having a thermal expansion, wherein the coefficient of thermal expansion of a methanol saturated copolymer of hexafluoropropylene and vinylidene fluoride is significantly higher than the coefficient of thermal expansion of water. Further more the mixture

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of compounds have different solid-liquid phase change temperature ranges. As a result of this extremely high coefficient of thermal expansion, the volume of the heat responsive material required to respond to a certain temperature change is significantly reduced. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to replace the phase change material as taught by Allen, with the phase change material as taught by Abu-Isa, in order to perhaps be constructed in a more compact size environment as already suggested by Abu-Isa.

Allowable Subject Matter

4. Claims 13 and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

5. Claims 15-21 allowed.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art cited in the PTO-892 disclose related devices. Miyazawa discloses a thermal energy converting device.

7. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Examiner Jeanne-Marguerite Goodwin whose telephone number is (703) 305-0264. The examiner can normally be reached on Monday-Friday (9am-6pm), alternate

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Fridays off. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7724. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

A handwritten signature in black ink, appearing to read 'D L M', is positioned above the printed name of David Martin.

JMG
Dec. 22, 2003

DAVID MARTIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800